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APPENDIX No. 5—Continued.

December 23, 1846.—San Diego.

DETERMINATION OF TIME.

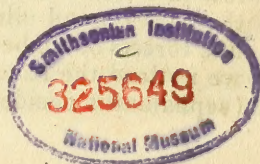
Time, p. m.	Double altitudes of α Andromedæ, in the west.	Chronometer fast.
<i>h. m. s.</i>	<i>Deg. min. sec.</i>	<i>h. m. s.</i>
5 54 56.5	99 41 10	8 56 58.0
5 55 33.0	99 26 10	8 56 58.7
5 56 16.8	99 07 25	8 56 57.7
5 57 08.5	98 46 15	8 56 58.9
5 57 58.2	98 26 10	8 56 60.4
5 58 54.6	98 01 50	8 56 58.9
5 59 52.8	97 37 20	8 56 58.5
6 01 23.8	96 59 15	8 56 58.5
6 02 10.0	96 39 40	8 56 57.8

Thermometer 54°.

Time, p. m.	Double altitudes of α Orion, in the east.	Chronometer fast.
<i>h. m. s.</i>	<i>Deg. min. sec.</i>	<i>h. m. s.</i>
6 06 25.5	94 42 45	8 56 54.8
6 07 17.5	95 01 45	8 56 54.3
6 08 02.5	95 18 35	8 56 55.1
6 08 57.6	95 38 35	8 56 55.9
6 09 47.8	95 56 10	8 56 58.6
6 10 25.2	96 10 35	8 56 56.9
6 11 02.0	96 23 25	8 56 58.7
6 11 55.6	96 43 45	8 56 56.59
6 12 43.5	97 01 20	8 56 56.7

Thermometer 54°.

Mean of 18 observations, 8h. 56m. 57.52s.



U.S. Engineer dept.

[Report made by Lieut. J. W. Abert...]

APPENDIX No. 6.

WASHINGTON CITY, October 8, 1847.

SIR: I have the honor to submit, herewith, a report of such objects of natural history as came under my observation while I was attached to the topographical party, under your command, during the journey from Fort Leavenworth to Bent's Fort.

The plants which were collected were submitted to the inspection of Dr. Torrey, to whom I am indebted for their names.

With great respect, I am, sir, your most obedient servant,

J. W. ABERT.

Lieutenant U. S. Top. Engineers.

To. Lieut. W. H. EMORY,
U. S. Topographical Engineers.

Notes of Lieutenant J. W. Abert.

On the 27th of June, 1846, we set out from Fort Leavenworth. The day was clear and bright; the woods were rejoiced with the voice of the mocking bird, and of the many little warblers that would join in the chorus of his song; the bluebird was there with his sprightly notes, and the meadow lark, perched on some tall mullein weed, caroled forth his song of love. As we were heartily tired of remaining quiet, we were well prepared to enjoy the beautiful scenes that our progress gradually developed. The ground is what is called "rolling prairie," of gentle curves, one swell melting into another.

The soil around is extremely rich; the whole country is verdant with the rank growth of the "tall grass," as it is called by way of eminence, when compared with that which grows beyond the region of the walnut and the hickory.

Here are many varieties of useful timber: the hickory, the walnut, the linden, the ash, the hornbeam, the maple, the birch, and the beech, also the cotton wood; but, beyond the limits of the "tall grass," there is the cotton wood only.

Five miles from Fort Leavenworth we passed a large butte, called "Pilot Knob;" its top is flat, and unites with the vallies below in a curve like that of a rope slackly drawn; spreading over the valleys, and climbing almost to the top of the butte, we saw fine forests of timber, consisting chiefly of oak. Among the shrubs, we noticed the hazel, (*corylus Americanus*), and the button bush, (*cephalantus occidentalis*); among these the wild grape had twisted

its tendrils and was growing so luxuriantly that it was with great difficulty one on horseback could force his way through.

On the hill sides, the wild rose was still in bloom, and mingled its pink flowers with the beautiful white clusters of the Jersey tea, (*ceonothus Americanus*.) The prairies were covered with tall stalks of the rattlesnake weed, (*rudebeckia purpurea*.)

Some of our mules proved very refractory, but we soon conquered them with the aid of the "lazo," or cabriesto, as it is often called—a rope of hair, or plaited hide, 50 to 60 feet long, in which a noose is formed that, by a skilful hand, is easily thrown over the mule's head, the noose being gradually tightened, the animal soon falls to all appearance lifeless. Now, the bridle, the saddle, and packs are fixed, the noose loosened, and the mule rises ready for the journey.

After a march of twelve miles, we encamped near a log house, close to a fine spring of cold clear water. Here we noticed the white hickory, or downy hickory, (*juglans pubescens*,) the chestnut oak, (*quercus prinus acuminata*,) the spicewood, (*laurus benzoin*,) and, deep in the woods, the modest May apple, (*podophyllum peltatum*,) and bloodroot, (*sanguinaria canadensis*.)

As we retired to rest, the sky became cloudy, and in a little time a plentiful shower of rain fell, which annoyed us greatly as it drove through our tents.

28th.—During the early portion of the morning, the rain continued with some abatement, and, as the sky showed signs of clearing off, we commenced making our arrangements for the march. I went down to a log house close by, and, whilst examining it, was attracted by the chirping of birds, and, on searching, found that the sound proceeded from the chimney, and I there discovered a beautiful nest, in the shape of a half basket, firmly attached to the chimney walls with clay, lined internally with horse hair and soft grass, and covered externally with moss; within were five unfledged birds, their eyes scarcely open, and at every sound they heard they would open their mouths and scream for food. The anxious parent several times darted down near my head. I wished much to ascertain its species, but, although it lit on the trees near the house, I could not get near enough to make any decision, and, as I did not desire to kill a bird with young, I had to content myself with the name some of our people gave it, to whom I pointed it out, and who called it the "grey bird."

After some little trouble with the mules, we got off about 7 o'clock; the rain had made the roads slippery, and the wheels cut into the soft mould so that the mules labored hard; at length we reached a sudden rise, where, in spite of our efforts, we were obliged to remain until one of the volunteer teamsters, seeing our difficulty, kindly brought us three yoke of oxen, and soon drew us up the slope. Passing on over gently rising and falling swells and vallies, with the delightful breeze that one almost always meets on the prairies, we felt our spirits rising with the clearing away of the clouds, and when the sun broke forth in splendor the sensation was truly exhilarating. Whenever we rode to one side of the

road, we noticed that our horses would frequently sink to the fetlock, and saw on the ground little piles of loose earth, like small ant hills, being about 5 inches high and 10 or 12 inches in diameter at the base, and without any opening; they are formed by the sand rats or gophers, (*pseudostoma bursarius*,) and although their habitations cover the prairies, there are few persons I have met with who have ever seen them.

On our route we started several prairie chickens, (*tetrao cupida*.) After a march of 11 miles we reached Stranger creek, a romantic little stream of water, clear as crystal, that ripples over a pebbly bottom. The banks are high and composed of rich loam that nourishes immense oaks and sycamores, (*platanus occidentalis*.) The banks were now so slippery from the rain, and so steep withal, that we were necessitated to unload our wagons before we could achieve the ascent. We were soon encamped, and had our bedding exposed to the sun to dry. We noticed a great quantity of the orange colored asclepias, (*asclepias tuberosa*,) around which gaudy butterflies were flitting. The low grounds near us were covered with a prickly button-head rush, (*eryngium aquaticum*,) the roots of which, when candied over, formed the kissing comfits of Falstaff.

The woods were skirted by a dense growth of hazel, plum trees, and tangled grape vines. Here, too, we found the little quail, (*ortix virginiana*,) suddenly rising up from under our feet, and startling us with the whizzing sound of its wings. This evening the mosquitoes were very numerous, and we lay down to be tormented by these provoking pests; but few of us were able to sleep, although none of us slept very comfortably last night.

29th.—Yesterday evening, we found that the hind axletree of our wagon had been split in crossing the creek; and, being fearful lest we should break down at some place where good timber could not be obtained, we sent out two men to procure a piece of timber, and they soon brought in a fine piece of hickory, dragging it into camp by the means of a "lazo" that they had affixed to it and had then passed round the neck of a mule. Luckily for us, there was a good carpenter in the volunteer camp, and although his tools consisted only of a saw, an axe, a drawing knife, and an auger, he, nevertheless, managed to fashion a very good axletree. This work detained us until 1 o'clock, when we started for the Kansas river, having, through the kindness of Colonel Ruff, obtained a new teamster in place of the one who deserted last night.

The prairie was yet what is called rolling; the flat bottoms were covered with the rosin weed or polas plant, (*silpicum laciniatum*,) whose pennate-parted leaves have their lobes extending like fingers on each side of the mid rib. It is said that the planes of the leaves of this plant are coincident with the plane of the meridian; but those I have noticed must have been influenced by some local attraction that deranged their polarity.

The orange colored asclepias, (*A. tuberosa*,) and the *melanthium virginicum*, a white-flowering bush, were also abundant.

The timber on the ravines consisted of the white oak, (*Q. alba*.)

black jack oak, (*Q. ferruginea*,) mulberry, (*morus rubra*,) walnut, (*F. nigra*,) the hickory, the red bud, (*ericis canadensis*.) The nettles (*urtica canadensis*) had grown to the height of 7 or 8 feet, all of which show the prodigal fertility of the soil.

As we approached the Kansas river its tributaries seemed to multiply rapidly, and the rolls in the prairie became more abrupt.

At 3 o'clock, we ascended a high ridge that gave us a fine view of the whole surrounding country. Presently reaching a little stream, whose banks were excessively steep and slippery, the wagons attempted to ascend; but one of the wagon wheels sank deep in the mud, and completely stopped all progress; we were therefore obliged to unload everything, and then clap all hands to the wheel, when we rose the hill amid the cheers of the men. A Frenchman, mounted on a wild mule, had already crossed and was standing on the western bank, which is 10 or 12 feet in height, when the mule suddenly sprung off the bank into the creek, just grazing with its feet the head of one of the men over whom it passed in its desperate leap. No one was hurt, and the Frenchman still sat as firm as ever.

As we neared the Kaw or Kansas river, some of us went in advance and soon reached an Indian house; the occupants said they were Shawnees. They appeared to be very comfortably fixed; had plenty of fine looking cattle, pigs, and chickens; within a few yards of the house, a clear stream of good water spouted forth from the side of a hill. We learned of the Indians that the distance to the Kaw river was $1\frac{1}{2}$ miles.

Crossing a high ridge, we enter the Kansas bottom; it was overgrown with a tall grass (*arundo phragmites*) from 5 to 6 feet high, and mingled with this was the long-leaved willow and the cotton wood. A quarter of a mile from the river bank, we entered the timber, consisting of the varieties already mentioned; the ground on which it grew was a deep loose sand difficult to get through.

In the river we found two large flat boats or scows manned by Shawnee Indians, dressed in bright-colored shirts, with shawls around their heads. The current of the river was very rapid, so that it required the greatest exertions on the part of our ferrymen to prevent the boats from being swept far down the stream. We landed just at the mouth of the Wakaroosa creek. Here there is no perceptible current; the creek is 14 feet deep, while the river does not average more than 5 feet, and in several places is quite shoal.

It was nearly 10 o'clock before all our company had crossed, and was so dark that we could scarcely see to arrange camp; so we lay down on the river bank and sent our horses out on the prairie to graze. We finished our suppers at 12 o'clock and lay down again to sleep; but, worn out as we were, the mosquitoes showed us no compassion, and large hooting owls, (*bubo virginianus*,) as if to condole with us, commenced a serenade.

The pure cold water of the Wakaroosa looked so inviting that some of us could not refrain from plunging beneath its crystal surface; one of the flat boats formed a convenient place from which to spring. The sun was rising, surrounded by golden clouds; in

one of the flat boats, three of the Indians who had assisted in ferrying us over were soundly sleeping, and far away stretched the gradually diminishing trees that overhung the Kansas water; the kingfisher (*alcedo alcyon*) was darting along, uttering his shrill rattling scream; flocks of paroquets (*centurus Carolinensis*) were circling over head, screaming and darting amid the tall walnut and sycamore trees.

We now made ready for our march, having engaged a fine looking Indian lad to go with the party. Our horses had not had much time to eat last night, and seemed disinclined to pass through the luxuriant grass that lay on each side of our road, and were constantly trying to snatch a mouthful of the delicious herbage.

At 8 $\frac{1}{4}$ o'clock we had a glimpse of the Wakaroosa buttes; on our right there was a large corn field, of about 30 acres, then a line of timber stretching as far as the eye could reach; on our left lay the broad rolling prairie, and directly in front we could see the road crossing the swells of the prairie, until it could be no longer distinguished. As we continued to advance we found that our road lead us directly between the two buttes.

We soon reached them, and then saw the "divide" that separates the waters of the "Wakaroosa" from those of the "Alaris des cygnes," or Osage; (as it is called near its mouth;) upon this divide the Santa Fé road is laid out.

We soon saw the Oregon trail, which here unites with that to Santa Fé; shortly after passing the junction of these trails we reached a steep declivity that forms the bank of a small stream, and noticed that the Indians had been working here for coal; in the superincumbent shale we found traces of fossils resembling the broad flat leaves of the iris (*fridæ*.) While we were examining this formation, my horse, that had been driven almost mad by the flies, (*tabani*,) broke from his fastenings and rushed into the creek, in order to roll in the water, and thus free himself from his tormentors; what a misfortune! for my saddle and pistols were on his back; some of the party dashed towards him, and, springing up, he galloped off, scattering all my accoutrements on the road; but I recovered every thing, even my pistols.

We continued on over a broad flat-bottom of marshy land, but found, before we had proceeded far, that our course bore too much to the north. We, however, continued to follow on in hopes it would take a turn, but were disappointed. As it was now late, we encamped on the Wakaroosa river, having marched nine miles. During the day, our animals suffered greatly from the horse-fly, (*tabani*;) these flies completely covered the necks and shoulders of the horses and mules, tormenting them excessively.

Amongst the birds observed this day, were the dove, (*ectopistes Caroliniensis*;) the flicker, (*gieus auratus*;) the blue bird, (*sialia Wilsonnii*;) the hurting, (*pipilo erythrossthalmus*;) and the crow, (*corvus Americanus*.) The last mentioned birds were lounging near a large cornfield, and were, doubtless, watching with interest the ripening of the grain.

Those friends of the prairie voyageur, the cow-bird, (*molothrus*

pecoris,) made their appearance, and no sooner had we picketed our animals than those birds installed them on their backs.

The elder (*sambucus pubescens*) was still in bloom, and the orange *asclepias* still displaying its gaudy flowers, much to the delight of the brilliant butterflies that sported around it, and are so constantly found near it, that it is often called the butterfly plant.

Our camp is on a high point which separates the branches of a little stream; the grass around is good, and our situation high, and must bid defiance to the mosquitoes. Along the margin of the creek I found a beautiful lily, (*lilium tigrinum*,) of a bright orange color, and beautifully dotted.

On *July 1* we arose early and made our way back to the trail we had left. After a march of three miles we reached the route sought for; we then rose to the top of the "divide," which unites with the Wakaroosa valley by a series of slopes that resemble the exterior slopes of parapets, their crests changing direction suddenly, so as to form sharp angles like those of a bastion; we ascended 15 feet, and on taking a bearing back, found that the Wakaroosa buttes were north 40° east.

After travelling three miles further, we reached the broad trail of the traders from Independence, Missouri, to Santa Fé.

As our horses moved through the grass, the horse-flies seemed to be shaken from the spikelets, as the farina from the stamens of corn, when shaken by the wind; then rising up, they covered the heads and necks of the poor animals, making them frantic with pain; they would rub against each other, and stamp their hoofs; and some would place their heads so as to get the benefit of the switchings of another's tail; and even the riders were annoyed by their desperate efforts to get rid of these persecutors.

Before we had proceeded far, we met a man driving an ox team; he had accompanied some of the volunteer companies to carry provisions; and, having emptied his wagon, he was now on his return. He told us that it was twenty miles from the next pool to water, so we determined to camp soon; and, having made a march of eleven miles, we pitched our tents on the very same spot on which we had encamped one year previous. Here we collected some beautiful flowers, amongst which were the *rudbeckia hirta*, and the delicate bed straw, (*galium tinctorum*.)

The stream upon which we were was then merely a line of unconnected pools. The only trees to be seen were some tall elms, (*ulmus Amer.*), in whose tops several turkey vultures (*cathartes aura*) were preparing to go to roost, while below, amongst the willow brush that bordered the stream, some cat birds (*orpheus carol.*) kept up a low conversation as they plunged into the inmost recesses of the undergrowth.

July 2.—As we had the twenty mile stretch to make to-day without water, we arose early. The dew last night had been very heavy, and we found little pools of water standing on the tops of our mosquito bars, for we had been obliged to desert the tent where our bars could not be fixed conveniently.

The mounds made by the gophers or sand rats were more abundant than heretofore, and in several places a number of these mounds had been made so close together that the distinctness of each was completely lost in the mass, covering an area of five or six feet.

Our road was full of plovers, (*charadrius marmoratus*;) they would run along before us with great rapidity; then stop until we approached quite close, when they would run off again. Thus they kept travelling before us all day. We shot several of them, and I preserved some of their skins, more as a memento of the prairies than as a curiosity, for these birds are very abundant in the United States, from Canada to the gulf of Mexico.

As we proceeded on our journey, we heard the confused hum of thousands of grasshoppers, now and then broken by the chirping of the cricket. These insects are found in great abundance, and obtain greater size than any I have seen elsewhere. I got a cricket this morning that measured $1\frac{1}{2}$ inches in length of its body.

We now entered on the level prairie, where nothing was to be seen but a wide expanse of green grass, and the sky above filled with cumulus clouds, the shadows of which, as they fell upon us, added to the refreshing effects of the delightful breeze one generally meets upon the the prairie. After travelling a long distance over a country, the irregularities of which were so imperceptible that one almost doubted their existence, we reached that position which I took to be the top of the divide. Here lay the half devoured carcass of an ox that had, doubtless, succumbed to the fatigues of the journey and deprivation of water; for these animals suffer much more from want of water than the mule. Some turkey vultures, sailing above our heads, showed that they were not ignorant of the locality of the carrion.

In a little while after passing the ox's carcass, we reached 110 mile creek, which is 22 miles distant from our last night's camp. At this creek there is a fine grove of timber, containing all the varieties found in the vicinity of Kansas river.

About 12 o'clock we reached this creek, and we here found the robin, (*turdus migratorius*;) the cat bird and the blue bird; and, high above us, the swallow-tailed hawk (*nauclerus fuscatus*) was sweeping round in graceful circles, its white head glancing in the sunlight. I asked the Indian lad to shoot it for me with his rifle; but he gazed upwards at the bird, and seemed so struck with the beauty of its movements that he uttered not a word, but shook his head to signify that the bird was too fair for him to kill it. I should think it impossible for smaller birds ever to escape this hawk, which unites the form and swiftness of the swallow with the boldness and strength of wing of the falcon.

Nigh the banks of the stream there was a low piece of ground covered with the purple monarda, (*monarda allophylla*.) The gaudy butterflies that I have spoken of before, as flitting around the asclepias, were now sucking the sweets of these flowers.

Before we had fairly pitched our tents, young Mr. Nourse, of Washington city, entered our camp. He had, alone, boldly set

off from Fort Leavenworth the day after we had left, determined to overtake us. We were delighted at his safe arrival; nor were we less pleased when we found that he had brought letters from the friends and relatives whom we had left behind.

July 3.—We arose early this morning to gain as much of the cool portion of the day as possible, determined to push on and see if we could not get rid of the flies that are so troublesome to our horses. The poor brutes seem to have no time to graze; and, when picketed out, they employ their feeding time in rolling in the grass and kicking frantically, so that the ground resounds with the stamping of their hoofs; and, in taking observations with the aid of the artificial horizon, one is obliged to select a spot at some distance from the horses, to prevent the jar which they produce from disturbing the surface of the mercury. The season appears to be unusually dry; 110 mile creek, which at this time last year was full of water, now has only a few scattered pools in its bed.

All day we had a brisk breeze from the southwest, making the travelling very pleasant. The plover and cow birds were playing along the road in front of us, and catching the grasshoppers that were scattered around in unlimited profusion.

At 10 o'clock, having marched 15 miles, we reached Independence creek, so called by Colonel Frémont, in consequence of our encamping here on the 4th of July, one year previous. This creek contains the only running water we have seen since leaving our camp by the Wakarusa river. Along the road side, I gathered a plant called lamb's quarter, (*chenopodium album*), the plantain weed, (*plantago major*), and a beautiful sensitive plant, with a yellow flower, slightly resembling the violet, (*cassia chamaecrista*.)

We encamped seven miles beyond Independence creek, in a ravine timbered with the elm, the cotton wood, the hickory and the oak. Some of our hunters went out and killed several wild turkeys, (*meleagris gallopavo*.) We saw a flock of curlew, (*numenius longirostris*), and some teal, (*anas carol*.)

Saturday, July 4.—At 5½ o'clock, this morning, we crossed the creek upon which we had encamped, and soon reached an elevated piece of ground, from whence we could see our road crossing a high ridge in a direction S. 60° W. Whilst prosecuting our march we noticed two distant spots in the horizon; and, as we neared them, we judged, from the white light that one of the objects reflected, that they might be mounted men. Before long we met them, and found our conjectures correct. They said they were traders, and had been as far as Council grove.

At 7 o'clock, we crossed a stream of running water; at 8 o'clock, we reached one composed of pools, its banks heavily timbered with walnut, and we also noticed the buckeye, (*pavia lutea*), and, skirting the stream, gooseberry bushes, (*ribes triflorum*), and elder. At 12 o'clock, we reached Rock creek. This stream is very appropriately named, as its banks chiefly consist of rock. Near where the road crosses there is a large pool from four to five feet in depth, forming a fine bathing place; but we did not stop here, as we were anxious to reach some eminent place in honor of the day. We

pushed forward for "Big John spring," which we reached at 5 o'clock. Here we luxuriated on the delightful cool water of this celebrated spring, reclining under the shade of a tall oak "*subtégmine querci*," at whose base this spring originates; the temperature of the water being only 53°, while that of the air ranges above 80°.

We saw to-day two beautiful varieties of the evening primrose, (*œnothera biennis*,) the white and the yellow. We noticed amongst the birds the brown thrush, (*orpheus rufus*,) the king bird, (*muscipapa tyrannus*,) the grouse (*tetrao cupido*,) and the little quail.

Sunday, July 5th.—We wished, as we started this morning, that we could have taken this spring along with us, the water was so beautifully clear and so cold, and the spring shaded from distance around by a grove of the walnut, the sycamore, and the oak, around the trunks of which the ivy (*rhus radicans*) clambered, and at the roots of which grew beautiful *lychnis*.

Two miles from our point of departure is Council grove, where there is a fine stream of running water, and great quantities of quartz and highly fossiliferous limestone.

Shortly before Council grove, we passed the grave of a white man, who had been murdered by an Osage Indian; a circular pile of stones marks his resting place; from the crevices between the stones the ivy has shot forth; over the grave a long pole leans mournfully: When I viewed this simple grave, my mind turned to the proud monuments which are built up by the wealthy in our great cities, and which are daily leveled with the ground to give place to some improvement. Here, on the wild prairie, the Indian and the rude hunter pass by this spot, and not for worlds would they remove one stone.

Continuing our march, we travelled over a distance of 20 miles, when we reached "Diamond spring." This is a fine large spring, of three or four feet across, the water extremely cold; the temperature of the spring is 54°, while that of the air, the thermometer in the shade, is 87°.

I procured at this place a beautiful white thistle, (*cnicusacarna*,) of delicious fragrance. We saw a great many night hawks (*chordeiles virginis*) and plovers, as well as several herds of deer, (*cervus virginianus*.) I also collected some of the great grasshoppers of the prairies.

Monday, July 6th.—As we set out on our march, the wagon mules took a freak in their heads and endeavored to run off with the provision wagon, but the driver turned them into the wide prairie, and soon succeeded in quieting them for a time, but he had several trials for the mastery before the day's march was over. After travelling 15 miles, we arrived at "Lost spring," but did not stop as its appearance was not inviting.

We noticed near the road numerous large puff balls or fungi, that resembled, both in size and appearance, human skulls of most beautiful whiteness; the under side is puckered as if a napkin had been thrown over a round body and drawn with a string; the interior resembles flour, except that it coheres.

Continuing our journey we pressed forward rapidly, in order to reach Cottonwood fork, which is nearly thirty miles from the place where we were encamped this morning. We had a tedious march and did not reach the creek until 3 o'clock.

Our animals were very much jaded, and add to this that, the moment we reached our goal, myriads of horse flies attacked our cavalcade furiously. In the efforts of the beasts to rid themselves of the flies, they often became entangled in the "cabrestoés;" we were obliged to protect some of them by loose clothing; the mosquitoes, too, were troublesome to horses and riders.

Cottonwood fork is a tributary of the Neosho, as well as Council grove creek and the waters intermediate. This stream is timbered with large cotton wood trees that keep a continued rustling of their leaves, for the slightest breeze makes them tremble.

We noticed here thickets of the elder (*S. canadensis*) in full bloom. The beautiful monarda (*M. allophyla*) covered the low portions of the banks of this stream, while on the little sand bars, and close to the water's edge, a dense growth of the long leaved willows overhung the clear water, in which sported the black bass, the cat fish, and the sun fish. Just where the road crosses, there is a fine pool of water, from five to six feet deep and twelve feet wide.

Tuesday, July 7.—We concluded that it would be best to remain here for the day, as our animals looked much harrassed by what they have already undergone. We employed ourselves in getting all our affairs arranged in complete order; for we expect that this is the last stop that we shall make for some time to come. Everything was overhauled, our clothes were all washed, and all those arrangements, such as a journey of this kind suggest, but which our continued movement did not permit us to accomplish, were this day executed.

Around our camp the ground looked golden with the different varieties of the golden rod, (*solidago*), and along the stream we saw box elder, (*acer negundo*), and extended thickets of plum bushes.

Not far from the camp we saw some antelope, (*dicranocerus furcifer*), so we sent out an old voyageur with the Indian hunter in pursuit of them; but they returned unsuccessful, and reported that the antelope were extremely shy.

About 4 o'clock several companies of volunteers made their appearance, and until it was quite late we heard the tramp of horses, the clashing of sabres, and jingling of spurs; at last they all arrived, and the camp was quiet, save the howl of the sentinel wolf.

Wednesday, July 8.—At 5 o'clock this morning we were on the route for the Turkey creeks; they are three in number, and unite a few miles below the points where our road crosses them; the day was pleasant, for the sky was overcast.

We had now reached the short grass, that is not more than four or five inches in length, and we saw little patches of the true buffalo grass, (*sesleria dactyloides*), a short and curly grass, so unique

in its general character that it at once catches the eye of the traveller.

On either side of us we observed little circular spots marking the places where the buffalo once wallowed; for these huge animals have a habit of throwing themselves on their sides upon the ground; they then commence walking, as it were, with their feet on the circumference of a circle; this causes their bodies to revolve, and thus result circular depressions in the prairies; these, after a rain, are for a long time filled with water, with which the traveller is often fain to slake his thirst.

These old wallows are now overgrown with plants that grow more luxuriantly than on other portions of the prairie. There is the splendid coreopsis (*coreopsis tinctoria*) and the silver margined euphorbia; (*euphorbia marginata*;) these at once arrest the attention.

It is seldom, now, that the buffalo range this far; no signs of old excrements are to be seen, and the bleached bones left upon the plains by the hunter have long since mouldered away. Towards the close of the day we found the frontal bone of a buffalo's skull, the only sign, in addition to the wallows, of this animal having been once abundant.

Along the road were numbers of the beetle, laying in their winter stores, "*haud nonignari aut incauta futuri.*" We stopped to noon, at 11½ o'clock. After a halt of half an hour, we started again, and at 12½ o'clock, formed our camp on Turkey creek. Here not a stick of timber is to be seen, but we found some beautiful plants with brilliant scarlet flowers (*malva pedata*) and roots which are eatable. We also obtained specimens of the pomme blanche, (*psoralea esculenta*;) and in the waters of Turkey creek we caught some sun perch and catfish.

The men killed several rattlesnakes near our camp, and one a grey snake, marked with a row of blackish spots along the back; it is said never to exceed two feet in length, and is called the grey rattlesnake. Before dark, the sky became black with clouds, whose appearance was soon followed by a heavy shower of rain.

This day, 9th, at daylight, we struck our tents and commenced our march; heavy clouds were at intervals passing over us and completely deluging us with rain. When the rain would cease, we would stop a few moments and let our animals rest. We noticed some buffalo skulls near the road; they must have lain here many years, as they were crumbling to pieces. At 3 o'clock we reached the Little Arkansas, a tributary of the great river the name of which it bears. This stream is from five to eight feet in width, and averages five inches in depth; on its banks were some large elms and box elder; we also saw the common elder, (*sambucus*;) narrow leafed willow, and the grape, (*vitis aestivalis*;) the sorrel (*oxalis stricta*) and lamb's quarter, (*chenopodium album*;) grew near the stream.

The rain had ceased as we entered camp, and as the antelope appeared abundant and at no great distance, Menard was

sent to shoot some of them, but his gun had got so wet during the day it would not fire.

We noticed to-day the pink sensitive plant (*schrankia uncinata*) of most delicious fragrance, so that my hat, into which I had thrust some specimens, was pleasantly perfumed. With this plant, we also found a white variety, (*darlingtonia brachypoda*;) the flowers and leaves are smaller than the plant first mentioned, and has no odor.

Late in the evening several of the volunteer companies came up; they said they were suffering for want of provisions; as the commissary waggons had got on too far in advance, they sent forward to have some of them return. But we were all suffering from a cause that produced in some of us feelings more unpleasant than hunger; the blowfly had peopled our blankets with living masses of corruption; it is said that these insects were never before seen so far out in the prairies.

Friday, 10th.—It is still raining, the clouds are chasing each other rapidly across the sky, and now and then the rain pours heavily down. We remained in camp some time waiting for the rain to stop. We thus lost several hours, but we found travelling in the prairies rather increased the chafing of our animals. We noticed to-day some swallows, (*hirundo bicolor*;) also the turtle dove, the little quail, the blue jay, (*garulus cristatus*;) and the king fisher (*alcedo alcyon*.)

We collected some lamb's quarter and had it cooked, and noticed along the road side the purslane, (*portulaca oleracea*;) this also would answer for the table of the prairie voyageur. Our day's journey was 16 miles.

Saturday 11th.—We were up this morning at 3½ o'clock, and ready for the start. Our arrangement of mosquito bars was broken in upon last night by a heavy shower of rain that forced us to retreat to our tents.

After marching three miles, we reached Cow creek; it was very difficult to cross on account of the miry bottom, but we got safely over without great delay. Before we had proceeded far, we caught sight of the "plum buttes," bearing N. 20° W. We passed through a large village of prairie dogs, (*Arctomys Ludoviciana*;) although now deserted, there were fresh signs of the dogs having thrown out some earth from their excavations. Last night's rain had, doubtless, forced them to leave their houses. In the ponds that had settled on the plain, we saw several craw fish, and the crickets were gathered around some ant hills. As our wagons moved along the road, the lizards (*lacerta lineatus*) were darting rapidly along the ruts in front of it, anxious to escape being crushed. The common land turtle (*testudo clausa*) were also very abundant. As we got quite near the Plum buttes, we caught sight of the buffaloes, (*bos americanus*;) and some five or six of our party immediately gave chase. The buffaloes ran around in a circle of three-fourths of a mile in diameter; so those who were near the centre of this circle had an excellent view of the chase. Holster pistols were the only arms used, and we soon had the plea-

sure of seeing one of the animals fall; the other then turned off into the wide prairie.

Near the buttes we collected some beautiful Gaillardias of different species. *Gaillardia amblyodon* and *G. pinnatifida* we found abundant over the remainder of our day's route. After a march of eight miles more we reached the banks of the Arkansas river, where we encamped. Here we found a large train of wagons, belonging to Messrs. Hoffman, of Baltimore.

Sunday, July 12.—We left the Arkansas and marched to Walnut creek, where we found Mr. Hoffman's party, they having started before daybreak. We here noticed the prairie gourd (*cucumis perennis*) and the cactus, (*cactus opuntia*;) also the "pinette de prairie," or *liatris pycnostachia*, with a great abundance of the common sunflower, (*helianthus annuus*;) the bright scarlet malva (*maiva pedata*) and the silver edged euphorbia, (*E. marginata*;) also the purslane, the convolvulus (*ipomen leptophylla*) *rudbeckia hirta*, and a species of cockle burr; and on all sides the little mounds of loose earth thrown up by the gopher, (*psedostoma brissarius*.)

We left Walnut creek at 3 o'clock, and entered upon vast plains of the buffalo grass, (*sesleria dactyloides*.) After a march of 11 miles we camped within five miles of the famed Pawnee rock. Our camp was a mile from the river; but we drove our horses to water and got our buckets filled. As there was no wood, we used the "bois de vache," and lay down near the smoke of the fires to avoid the mosquitoes. We had no sticks to support our mosquito bars. When we first arrived, the country around was covered with buffalo, but it was too late in the day to hunt; we therefore lay down quietly with the intention of having a fierce chase in the morning.

July 13th.—Last night we had a terrible serenade from a large drove of prairie wolves, (*canis latrans*.) These animals always hang on the heels of the buffalo, to pick up the infirm and those the hunters have wounded, as well as to prey on what is left of the slaughtered.

We got off in good time, and Lieutenant Emory, in company of one of our hunters, started for the buffalo. We saw the chase; as the herd would divide, and let the horsemen pass through, we heard the rumbling sound of their many feet; but at last they crossed the bluff that extends towards the north from Pawnee rock, and were lost to our view. Lieutenant Emory killed one of the herd; but our hunter came into camp empty handed. We halted a short time to pack the buffalo meat, and then proceeded to Ash creek. This creek was dry, so we continued our route among herds of buffalo that were continually dashing across our road, and at length reached Pawnee fork after a march of 18 miles.

The waters of this creek were so high that we could not cross; the trees along the sides of the banks were half hidden; the whirling eddies were rushing along with great velocity; the willows that grew on the banks were waving under the strong pressure of the water, and brush and large logs were hurriedly borne along on the

turbid bosom of the stream. We therefore camped by the side of the creek to await the subsiding of its waters. The country around was covered with the (*cucumis perennis*) prairie gourd, and we found it to be infested with those little striped insects that so much annoy the farmer in the United States, by the ravages they commit amongst the young vines.

This creek is timbered with the elm, (*ulmus Americana*), and the box elder, (*aceo negundo*.) We frequently, during the day, noticed the purslane and the "pinette de prairie;" in the low grounds the splendid coreopsis and the euphorbia were displaying their beauties; and on the uplands the prickly pear was seen in great abundance; but it had passed its bloom.

During the afternoon a man by the name of Hughes was drowned in attempting to cross the stream; there were two men with him at the time, but the current was so violent that it soon swept him out of reach. His friends brought his clothes to our camp, where they left them until they could recover the body.

We saw to-day large flocks of the tropical or yellow-headed blackbird, (*agelajus xanotocephalus*), also the common blackbird, (*quis calus versicolor*), and the Baltimore oriole, (*icterus Baltimore*.)

July 14th.—We were obliged to remain here all day, still waiting the pleasures of the waters. In the meanwhile I let one of the men to work to dig up a root of the beautiful prairie convolvulus, (*ipomea leptophylla*.) This man worked for several hours, for the ground was extremely hard, so that he was at last obliged to tear it up, leaving much of the top root behind. This root extended for about one foot and of not more than one-half inches in diameter, then it suddenly enlarged, forming a great tuber, 2 feet in length and 21 inches in circumference. The Cheyenne Indians told me that they eat it, that it has a sweet taste, and is good to cure the fever. They called it badger's food, and sometimes the man root, on account of its great size, for they say some of them are as large as a man. We also procured here the Mexican poppy, (*argemone Mexicana*); noticed quantities of a willow brush, and several specimens of the tooth-ache tree, (near *zanthoxylum fraxinum*.) This morning Laing brought me a very large toad, (*rana musica*), far exceeding any I ever before have seen. During the day I made a sketch of the country around our camp; the most recognisable feature is the bluff just on the west side of the stream, close to the ford.

In the evening some of us went over to visit Mr. Hoffman's camp; one of the gentlemen attached to the party had just returned from his first hunt, having killed four fat cows and brought in their tongues. Thus far we have noticed several plants that have been so common that I have neglected to mention them. One is the lead plant, or tea plant, (*amorpha canescens*), and is in some places so abundant as to displace almost every other herb; the other is what our men call prairie indigo, (*baptisia leucantha*), it bears a large black cylindrical pod, filled with kidney-shaped seed.

July 15th.—This morning we commenced making a raft, deter-

mined to wait no longer, and by sundown had completed a raft of dry wood, capable of bearing 1,000 pounds without being overloaded. The men worked with great energy, and it was truly exciting to see them straddle the huge logs and float down in the rapid current whose waters were rushing along with such a fierce rapidity, dimpling the surface of the stream with miniature whirlpools, and making the willows, now covered midway by the inundating waters, bend and spring as if moved by a hurricane. Sometimes rafts of brush and loose logs came rushing along, but the men stuck fast to the logs they bestrode, screaming out in wild excitement, as if to drown the gurgling sound of the wild waters.

To-day we saw several large white cranes with black-tipped wings; (*grus Americanus*,) and Laing killed me some rattlesnakes, (*crotalus horridus*) and several prairie snakes. Along the creek we found an abundance of plums (*prunus virgins*) and cherries.

Thursday, 16th.—As our raft was now completed we commenced crossing all our camp equipage, and by 11 o'clock everything was safely transferred to the south side of the stream. We were obliged to carry over much less at a time than we had hoped to have done, for our raft, built of the dryest wood that we could find, became water logged. The elm and box elder were the only trees we could get, and when green their specific gravity is but little less than that of water. The wagon body was placed upon the raft to distribute the weight that might be placed in it equably. A rope was stretched across on which a noose could slide, and this noose, by a long rope, was attached to our raft to prevent its being swept away in case the stretched rope should break. This precaution proved most wise, as the rope did break, but the knots upon it prevented the noose from sliding off, and our craft swung round into an eddy where it was comparatively calm.

We now proceeded to cross our cavalcade; some of the horses were first driven and went bravely over; others were very troublesome, but at length, seeing their companions enjoying the luxuriant grass, they all plunged in and arrived safe on the opposite side. Some had to struggle hard to get up the banks, that, in addition to their steepness, were covered with a thick coating of mud, deposited by the waters. It was a beautiful sight to see some of the finest of our horses spring from the high banks of the stream, to see the splash of spray as it showered around when the horse disappeared, and again to see the noble animal rise above the wave, snorting and dashing the waters from his mane, as he swam for the opposite shore. Our Indian lad seemed to enter into the spirit of the scene; he seized the cabresto of one of the wildest horses and dragged him down into the water; running out upon the raft, he stood for a moment, and then plunged into the stream, throwing his arms alternately as he dashed across. It is in such scenes as this that the Indians excel; their fine limbs, dark hair, and flashing eye lend all the imagination could desire to perfect the wild grace of motion, the picturesque of attitude that such occasions develop.

The water had fallen nearly 3 feet during the past night, and as it still continued to fall, the troops commenced crossing at the

regular ford, which is one-fourth of a mile above us; but lost several of their horses. To-day, the man who was drowned yesterday was buried, his body having been found by our men engaged in rafting. His friends sent to us for his clothes in which to bury him; and, before the sun went down, he was deposited in his long resting place: "requiescat in pace."

At 11 o'clock, Colonel Doniphan came to our camp and informed us that General Kearny wished to see us. We afterwards learned that the general had some inquiries to make in regard to the route by the Smoky Hill fork; a route that Lieutenant Peck and myself had travelled when we were attached to the command of Colonel Frémont; but the roughness of that country, the absence of all roads, and the scarcity of water and wood, and the poverty of the pasturage, render the Arkansas river route much to be preferred.

At 3 o'clock we commenced our march, and soon struck a road that we pursued until near 10 o'clock at night, when we encamped near some pools of water, having been made aware of our approach to them some time before they were in sight, by the cry of the killdeer plovers, (*charadrius vociferous*.) We soon kindled our fires of "bois de vache," and then found we had camped in a prairie dog village; a bad place for picketing horses, as the neighborhood is generally destitute of grass. On our march we obtained a singular species of cactus, resembling roundish bodies covered with long protuberances, whose tips were crowned with stars of white spines, (near *mammillaria sulcata*.)

We saw during the day many skylarks; (*alanda alpertris*;) they allowed us to approach quite close before they took wing and as they flew through the air sang sweetly.

Friday, 17th.—We have now entered that portion of the prairie that well deserves to be considered part of the great desert. The short, curly buffalo grass (*sesleria dactyloides*) is seen in all directions; the plain is dotted with cacti and thistle, (*carduus lanceolatus*;) while only in buffalo wallows one meets the silver margined euphorbia; and in the prairie dog villages, a species of *asclepias*, with truncated leaves.

We saw several wild horses; in one group there were three, and with our spy glasses we had a fine opportunity for examining them. There was a bay, a roan, and a black; they stood for some time gazing at us as if completely absorbed in looking at the strange sight, when, as we approached, they raised their long flowing tails and dashed off with their long manes waving round their necks, and with a speed that soon carried them out of view. Unlike the mustangs, these looked to be large and beautifully proportioned.

Buffaloes seemed as if trying to surround us. We saw scarcely anything else far or near. The whole horizon was lined with them, and their figures would sometimes shoot up to an immense height, as their change of position caused the visual rays to pass through mediums of different refracting power, while seeming lakes would spring into existence, whose farthest shore seemed widely separated from us by the broad volume of water that intervened.

There were many dusky wolves (*canis nubilus*) prowling around

the buffalo; the latter paid no regard to them, but let the wolves approach without showing the least repugnance, although the wolves devour the young calves and attack the cows at certain periods when they are least able to defend themselves. This species of wolf does not congregate in large packs like the prairie wolf, but roams solitary.

This evening five Pawnee Indians came into our camp. They were on foot, naked, and had their faces painted. As our party was very small, and we knew from the behavior of these fellows that there were plenty of Indians near us, we changed our position for one more defensible. All our horses were picketed close to the camp; the cabrestoes were shortened; wagons and tents arranged, so as to form a compact ring; the arms examined and the guard doubled; the whole camp was in a state of watchfulness, momentarily expecting an attack. I lay for the greater part of the night by the side of a wagon, with my rifle across the tongue, constantly expecting to see some redskins crawling amongst our horses; but the night was undisturbed, save with the howling of wolves and the bellowing of buffalo.

Saturday, 18th.—This morning, as soon as it was light, we saw a large band of buffalo, not more than 300 yards from us, walking slowly to the ponds close by; they were to the west of us, and as the wind did not blow towards them they paid but little regard to our proximity.

Some of the patriarchs of the band were on the lead; they were all moving with slow and measured tread, as if attending a funeral. Now and then some of them would cast a sinister glance towards us, but still continued to move on with the same slow pace. I got my spy-glass in order to examine them with great minuteness, and thence commenced making sketches. Soon there was a general commotion amongst the buffalo; they raised their tails, tossed their heads into the air; now and then the bulls would dash at each other, when suddenly the whole band separated into small dense groups that scampered off to the four winds of heaven. We instinctively grasped our guns, not knowing whether friend or foe might appear, and soon saw a number of horsemen urging their jaded steeds under the prickly spur. At every touch the impatient riders gave, the tails of the wearied horses were thrown into the air, and the slow gait at which they moved showed that they had been riding fast and far. They were pursuing a buffalo of immense size, apparently wounded; the buffalo now turned, but his intended victim shyed, and as the horsemen passed by, we saw the smoke of several shots burst forth; the horsemen now turned, and ere long the buffalo lay extended upon the ground. We saw them all dismount, and in a little while after Captain Karsons rode into our camp. We inquired the position of the main body, which we were anxious to rejoin, for ourselves were suffering from the harrassing night we had passed, and our horses were suffering from our being necessitated to picket them so closely for fear of Indians; and both ourselves and our horses daily suffered from want of water. As we were moving along, a band of buffaloes ran towards us; but as they passed, kept off some distance, running parallel with the road. Our Indian

friend noticed them, and as they passed, dismounted, stooped down, and drew up his rifle; as the smoke burst forth from the muzzle of his piece, we saw a fine buffalo cow lash her heels high in the air, and then continued to jump and kick for a quarter of a mile or more, when she fell and all the rest of the herd gathered around her. We already had the meat of two fat cows, and as the wagons were so far from the place where the cow had fallen, she was left to feed the wolves.

The ruts of the road were full of little lizards, sunning themselves; as we approached they would dart briskly away, manifestly disinclined to play the part of devotees to Juggernaut.

In crossing to the river we found the ground in many places covered with beautiful gallardias (*g. amblyodon*) and the eupatorium, while in the moist grounds we saw the curious dodder twining in its golden tendrils all the plants that grew around it, forming an inextricable entanglement.

Among the birds, we saw many of the sky-larks and several avocets (*recurvirostra* ames.) The tail and its coverts white, wings black and white, legs blue, and bill recurved.

When we first struck the river, we met with Major Clark's battalion of artillery, a fine body of troops, well uniformed and of soldierly bearing.

Having marched a few miles along the river bank, we formed our camp, after travelling this day a distance of 19 miles.

Sunday, July 19th.—Marching along the Arkansas bottom one is struck with the variety of swamp grasses. Here we find the triangular grass, (*scirpus triguctio*), and mingled with it in great abundance the scouring rush (*equisetum hyemale*) and the beautiful *liatris* (*liatris spicata*.)

After we had started, I went back three miles to meet Gen. Kearny in order to get some one to go with us and show us the exact location of the capture of the party of Texans by Capt. Cooke, 2d dragoons, in 1843. General Kearny detailed Lieutenant Love, who showed us the spot that we sought. On the south side of the river, there is a large grove of cotton wood trees that extends some distance along the river bank, and is the first grove of any size that the traveller west meets after passing Pawnee fork, which, by the route we came, is 64 miles distant.

In the evening we went to General Kearny's camp to get some of the horses shod. We had expected to have gone not more than three or four miles, but only reached them after a ride of eight miles, so deceived were we with regard to the distance by the purity of the atmosphere. As it was quite late, we concluded to remain here until the camp should overtake us in the morning.

Monday, 20th.—This morning we had not marched far when we saw General Kearny's guard stop and encamp. Soon Lieutenant Emory, who had crossed the river, rode over and informed us that General Kearny was very ill, and ordered one of our wagons to remain for the purpose of conveying the general on by easy stages; for our wagon was light and had good springs, while all the other wa-

gons with the army were without springs and roughly built, like common Santa Fé trade wagons.

This day we made a march of $31\frac{1}{2}$ miles, passing along the top of a barren ridge, between one and two miles from the river. Nothing was to be seen but the curly buffalo grass, now parched by the summer's heat. The sun poured down his rays most lavishly; the men all dismounted and walked, in order to rest and to relieve themselves from the singular sensation produced by the heat. First one and then another of the party became ill, and several were seized with a severe vomiting.

In the evening I went over to Major Clarke's camp, in order to have an axletree made. There I saw many who appeared to be ill; amongst them were Captain Weightman and Lieutenant Dorn.

I returned to our camp and passed a sleepless time, listening to the footsteps of the guard; and, now and then, the conversation of the French boys broke upon the stillness of the night; they, too, were not able to sleep soundly. We were all extremely anxious with regard to General Kearny's health.

Tuesday, July 21st.—This morning we presented quite a sorry looking array of human faces. At day-break I was seized with a vomiting, which lasted some time; I was obliged to send for the doctor. I however determined to push forward in compliance with the order of Lieutenant Emory, who was with General Kearny, and committed myself to the wagoner's care, while Lieutenant Peck took command of the camp. Lying here, my eye roved over but a confined prospect; under me were bundles of bedding, with blankets, red, blue and white; near me, a sick man, languidly gazing upward; above me, the bended bows of the wagon that supported a large white cover, through which the sun beat with intense heat; and, in front, through a little hole, one caught sight of the landscape dancing to and fro as the wagon jolted along.

We formed our camp, after a march of 11 miles, at the Santa Fé crossing, and in the vicinity of Major Clarke's battalion of artillery, so that we could have an opportunity of completing our axletree that we began yesterday. We soon saw our wagon, and learned that General Kearny had perfectly recovered.

At this place we obtained some beautiful purple lilies, (*eustoma russeliana*,) and Mr. Nourse brought me a *psoralia*, with a monosepalous calyx. On the opposite side of the river there are several Indian bodies, wrapped in blankets and skins, exposed on platforms of lodge poles, high up in cottonwood trees, where they are safe from wolves and the sacrilegious touch of men. The air of the prairie produces rapid desiccation, and, in this respect, resembles that of Egypt and the islands of the ancient Guanches.

From the 21st of July until our arrival at Bent's fort, on the 29th, being all the time sick, I have no recollection of anything that transpired, excepting a drawing that I made of the sand rat, (*pseudostoma brissarius*.) The body and legs are covered with yellowish brown hair, plumbeous at the base; belly, white; anterior claws, strong and large; posterior claws, short; iris, black; ear, projecting slightly. On each side of the upper jaw are two exterior pouches,

1 4-5 inches in depth; tail covered with short hair, a little less in length than one half the length of the body; body about 6 inches in length. The pouch is covered with short white hair, and capable of being turned inside out. This, I think, was a young one; hence the slight differences in the size and the color of its legs, and the tail being covered with hair.

Captain Turner, of the 1st dragoons, brought me a (*ortygometra carolinus*;) these birds are in plenty along the Arkansas bottom; this one was caught after a short chase, for it flew a short distance only, when it appeared to be too much fatigued, or too much bewildered to rise again.

Of the plants that occur between the Arkansas crossing and Bent's fort, I cannot do better than refer to the list appended to this report, in which they are arranged in the family to which they belong, and the locality mentioned in which they were obtained.

As one approaches Bent's fort, he meets with many varieties of *artemisia*, with the *obione canescens*, and a plant which is extremely useful to the Mexicans as a substitute for soap, by them called the *palmillo*, by us *Adams needle*, or *Spanish bayonet*; its botanical name is the *yucca angustifolia*. We also have the *prairie gourd*, (*cucumis perennis*;) that is abundant also from Bent's fort to Santa Fé. We have the *bartonia*, several varieties of *solanas*, several varieties of *cænothera*, the *martynia*, the *cleome*, the *salicornia*, *ipomea*, and *erigonums*. Amongst the trees, several varieties of *populus*; amongst which are the *populus canadensis* and *p. monolifera*; several varieties of *salix*, and the *plum* and *cherry*.

Amongst the animals, we have the *panther*, (*felis concolor*;) the *wild cat*, (*felis rufa*;) the *white wolf*, (*canis nubilis*;) the *prairie wolf*, (*canis latrans*;) the *silver-grey fox*, (*canis cinerea argenteus*;) and the *prairie fox*, (*canis velox*;) *prairie dog*, (*arctomys ludoviciana*;) the *gopher*, (*pseudostoma brissarius*;) the *antelope*, (*dicranocerus furcifer*;) the *grey bear*, (*ursus ferox*;) also a species of *vespertitia* and species of *ground-squirrel*; it is said that there are three different varieties. Along the Arkansas, where there is sufficient cover, one finds the *red deer*, (*cevus virgin.*) one also finds the *badger*, (*taxus labradoricus*;) and the *polecat*, (*mephitis Amer.*) The Indians at the fort showed me a *raccoon* (*procyon lotor*) skin, they said had been obtained in the neighborhood.

Amongst the birds, the *turkey vulture*, (*cathartes atra*;) *wild turkey*, (*meleagris gallipavo*;) *quail*, (*ortyx virginia*;) *red-headed woodpecker*, (*picus erythrocephalus*;) *meadow lark*, (*sturnella ludoviciana*;) *night hawk*, (*chorodeiles virgins*;) *cow-birds*, (*molothrus pecoris*;) *dove*, (*ectopistes carolin*;) *flickers*, (*picus auratus*;) *raven*, (*corvus corone*;) and the *railtailed buzzard*, (*batco borealis*.) There has also been found on the Arkansas, within eight miles of Bent's fort, a singular and but little known bird, called the *pasana*, (*geococyx viaticus*.)

RANUNCULACEÆ.

Clematis Virginiana. Raton pass and the mountain passes near Santa Fé.

Delphinium azureum. Raton pass.

Podophyllum peltatum. Woods near Kansas river, and at Council grove.

Ranunculus acris. Near the Wakarusa buttes.

Thalictrum cornuté. Near Pawnee fork.

Anemone Pennsylvaniana. Between "El Rio Cañadian" and "El Rio Moro."

Ranunculus aquatilis. Found in the "Raton creek" and head waters of the Purgatory creek.

MENISPERMACEÆ.

Menispermum Canadense. Near "Big John spring."

PAPAVERACEÆ.

Argemone Mexicana. First seen at "Pawnee fork," thence on to the Moro.

Sanguinaria Canads. Woods near the Missouri and Kaw rivers.

CAPPARIDACEÆ.

Polenisia graveolens. Near "Bent's Fort," and in the valley of the Timpas.

Cleome integrifolia. At "Big Sandy creek," "Bent's Fort," and Cañadian.

VIOLACEÆ.

Viola cucullata. Banks of "Pawnee fork."

CARYOPHYLLACEÆ.

Lyclinis. Woods of Council grove.

HYPERICEÆ.

Hypericum ellipticum. August 11.

PORTULACEÆ.

Portulacca oleracea. By the road side from "Pawnee fork" to the crossing of the Arkansas.

LINACEÆ.

Linum regidum. From "Pawnee fork" to "Arkansas crossing."

GERANICEÆ.

Geranium Frémontia. Occurs throughout the "Raton pass."

OXALIDACEÆ.

Oxalis violacea. Near Council grove.

———*stricta*. From Kaw river to Council grove.

ANACARDIACEÆ.

Rhus glabrum. Bank "Kaw river" and Wakaroosa river.
radicans. Woods at "Big John spring."
 near *R. aromatica*. August 13.

MALVACEÆ.

Sphæralcæ stellata, *Torr. and Gr.* "Raton pass" and "Rio Cañadian."

Sida coccinea. Arkansas river and El Rio Cañadian.

Malva pedata. Cottonwood fork and bottoms of Arkansas river.

Sida, (new species.) August 17.

VITACEÆ.

Vitis æstivalis. Along the Arkansas river and Purgatory creek.
riparia. Stranger creek.
vulpina. 110 Mile creek.

RHAMNACEÆ.

Ceanothus ovalis, *var. intermedia*, (*Torr. and Gr.*) Kaw river and Council Grove.
Americanus. Fort Leavenworth.

ACERACEÆ.

Acer negundo. Banks of Pawnee fork.

LEGUMINOSEÆ.

Astragalus. Bent's fort and Ocaté creek.

Glycyrrhiza glabra. Arkansas river.

Gymnocladus Canads. Kaw river.

Petalostemum, (new species.) At "Ojo Vernál."

Psoralea esculenta. "110 Mile creek" and along the Arkansas river.

- Robinia pseudo acacia*. Purgatory creek, near the Raton pass.
Baptisia leucantha. As far as Pawnee fork.
Cassia chamæcrista. First seen July 3, thence to the Arkansas crossing.
Petalostemum candidum. High prairies, as far as Bent's Fort.
 violaceum. With the preceding.
Psoralea floribunda. Pawnee fork.
Dalea laxifolia. With the preceding.
Lathyrus linearis. August 9.
Amorpha canescens. Fort Leavenworth to Pawnee fork.
Schrankia uncinata. Stranger creek to Arkansas crossing.
Darlingtonia brachy-loba. Pawnee fork and 110 Mile creek.
Glycyrrhiza lepidota. August 13.
Cereis Canads. Kansas river.

ROSACEÆ.

- Cerasus Virginiana*. Kansas river, Arkansas river, and Purgatory creek.
Fragaria Virginiana. Kaw river.
Rubus occidentalis. Missouri river and Kaw river.
 villosus. With the preceding.
Prunus Amer. Pawnee fork, Arkansas river, and Cañadian river.
Cralægus coccineus. Stranger creek.
Rosa lucida. Kaw river.

ONAGRACEÆ.

- Oenothera*. Several species occur from Kaw river to Bent's Fort.
Gaura coccinea. August 13.

LOASEÆ.

- Mentzelia nuda*. Bent's Fort and valley of the Timpas.

GROSSULARIACEÆ.

- Ribes accreum*. Purgatory creek and Timpas, near its head.
 triflorum. Diamond spring.

CACTACEÆ.

- Opuntia Missouriiana*. Pawnee fork, Purgatory creek, and Cañadian river.
Mammillaria sulcata. Near Pawnee fork.

CORNACEÆ.

- Cornus paniculata*. Big John spring.
 stolonifera. Stranger creek.
 Florida. Kaw river.

CAPRIFOLIÆ.

- Symphoncarpus glomeratis*. Purgatory creek.
occidentalis. With the preceding.
Symphora racemosa. Big John spring.

UMBELLIFERÆ.

- Sium latifolium*. Diamond spring.
Angelica. Head water, Purgatory creek.
Eryngium aquaticum. Near Wakaroosa creek.

RUBIACEÆ.

- Galium tinctorum*. Ponds near Lost spring.
Cephalanthus occidentalis. Stranger creek.

COMPOSITÆ.

- Senecio* (near) *palustris*. Raton.
filifolius. Bent's fort to Santa Fé.
Rudbeckia. Fort Leavenworth to Arkansas crossing.
hirta. Lost spring to Jackson's grove.
Erigeron strigonium. Pawnee fork.
Eupatorium purpureum. Turkey creek, Arkansas crossing, and Bent's fort.
Eurotia lanata. Rio Cañadian to Santa Fé and south.
Frémontia vermiculata. Valley of the Timpas.
Grindelia squarrosa. Arkansas river, near the crossing.
Solidago altissima. Bent's fort.
Solidago. Cotton-wood fork.
Liatris spicata. Crossing of the Arkansas river.
squarrosa. Plum buttes.
Silphium lacenatum. From Fort Leavenworth to Cottonwood.
Coreopsis tinctoria. Turkey creek to Bent's fort.
Asters. With the preceding.
Gaillardia amblyodon. Plum buttes, and on the Moro.
 With the preceding. (Leaves lanceolate.)
pinnatifida.
Helianthus. Abundant from Coro creek to Santa Fé.
dentatus. At San Miguel.

ERICACEÆ.

- Arctostaphylos uranasi*. Council grove.

LOBELIACEÆ.

- Lobelia leptostachya*. Cottonwood fork.
cardinalis. Bent's fort.

CAMPANULACEÆ.

Campanula rotundifolia. Raton pass.

OLEACEÆ.

Fraxinus Americanus. Ash creek.

APOCYNACEÆ.

Apocinum androsacmifolium. Lost spring.

ASCLEPIADACEÆ.

Asclepias verticillata. Stranger creek and Pawnee fork.
tuberosa. Fort Leavenworth to Cottonwood fork.

CONVOLVULACEÆ.

Ipomea leptophylla. Walnut creek to the Canadian river.
Cuscuta Americana. In the bottoms near the "caches."
Convolvulus. (Near sepium.) August 14.
Euploca convolvulaceæ. Raton pass.

BORAGINACEÆ.

Myosotis glomerata. Arkansas river, near caches.

POLEMONIACEÆ.

Gilia (cautua) longiflora. Raton pass.

LABIATÆ.

Hedeoma leptophylla. Near crossing of Arkansas
Monarda fistulosa. Near caches.
alloyphylla. 110 creek; Cottonwood fork.
Mentha peperita. Bent's fort.
Salvia azurea. Arkansas bottoms and New Mexico.
Teucrium Virginicum. Pawnee fork.

SOLANACEÆ.

Solanum nigrum. Bent's fort.
triflorum. Arkansas river, near crossing.
Nycterus lobatum. From the caches to Bent's fort.
Physalis. August 4.
lobatum. Near Bent's fort.

SCROPHULARIACEÆ.

Pedicularis canad. Near Pawnee fork.

CHENOPODIACEÆ.

Chenopodium album. From Fort Leavenworth to crossing.

Frémontia vermicularis. Purgatory creek and Timpas.

Artemisia. Purgatory creek.

Obione canescens. Valley of the Timpas.

Salicornia herbacea. Arkansas river crossing.

VERBENACEÆ.

Verbena pinnatifida. Rio Canadian and Rio Rayado.

angustifolia. Little Arkansas river.

Lippia cuneifolia. From Pawnee fork to Santa Fé.

CUCURBITACEÆ.

Cucumis perennis. From Walnut creek to Santa Fé.

NICTAGINEÆ.

Oxybaphus, (new to me.) *Torr.* Slender branching spears. "Rio los Animas."

nictaginea. Raton and "Rio Canadian."

POLYGONACEÆ.

Erigonum. Walnut creek.

tomentosum. Council grove.

Polygonum, (long lacerated sheath, no flowers.) Walnut creek.

amphibium. Turkey creek.

LAURACEÆ.

Laurus benzoin. Kaw river and Council grove.

EUPHORBIACEÆ.

Euphorbia marginata. Pawnee fork to Bent's fort.

hypericifolia. Turkey creek.

? By the road side, near the "caches," and in the buffalo wallows.

Croton capitatum. Crossing of the Arkansas river.

URTICACEÆ.

- Humulus lupulus*. Raton pass and Canadian river.
Morus rubra. Council grove and Kaw river.
Urtica canadensis. Kaw river and Stranger creek.

ULMACEÆ.

- Ulmus Americana*. Pawnee fork.
Celtis crassifolia. Woods at Council grove.

AMENTACEÆ.

- Salix longifolia*. Council grove, 110 Mile creek.
(no flowers or fruit.) Arkansas river.
Populus monolifera. Timpas, at head of Purgatory creek.
canadensis. From Kaw river to Santa Fé.
(new to me.) *Torr.* Rio Canadian.
Salix angustifolia. Arkansas river.

CONIFERÆ.

- Juniperus Virginica*. Timpas, and from Purgatory creek to Santa Fé.
(different from *Virginica*.) *Torrey*. Near Santa Fé.
Pinus monophyllus. Raton pass to Santa Fé.
rigida. As above.

MONOCOTYLEDONOUS OR ENDOGENOUS PLANTS.

ALISMACEÆ.

Sagittaria sagittifolia. Head of Timpas.

MELANTHACEÆ.

Melanthium Virginicum. Stranger creek and Wakaroosa river.

LILACEÆ.

Yucca angustifolia. From Bent's fort to "Fra Cristobal."

Lilium tigrinum. Wakaroosa river.

Enstoma Ruseliana. Bottom of Arkansas and Cañadian.

Allium vianale? Raton pass.

JUNEACEÆ.

Juncus tenuis. Raton pass.

COMMELINACEÆ.

Tradescantia Virginica. Fort Leavenworth to "110 Mile creek."
rosea. With the preceding.

Commelina angustifolia. Pawnee rock and Raton pass.
(long acuminate spatha.) Raton.

SMILACEÆ.

Smilax rotundifolia. Kaw river, Council grove, and 110 Mile creek.

CYPERACEÆ.

Scirpus triqueter. Low grounds near Arkansas crossing.
atrovirens. Pawnee fork.

Cyperus filiculmis. Little Arkansas.

Carex festuca. Wakaroosa river.

GRAMINEÆ.

Arundo phragmites. Arkansas, Timpas, and Cañadian rivers.

Sesleria dactyloides. Pawnee fort to Bent's fort.

Agropyrum. Stranger creek.

Atheropogon olygostachium. Canadian river.

Koeleria nitida. Pawnee fork.

EQUISETACEÆ.

Equisetum hyemale. Near crossing of the Arkansas.

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